

Listing of Claims

This Listing of claims replaces, without prejudice, all previous versions and listing of claims.

1. (Original) A process for connecting at least two substrates (1, 1') by means of bonding after pretreating at least one of the bonding surfaces, characterized in that for the pretreatment a plasma (2) is acting on the bonding surface under atmospheric pressure.
2. (Original) The process according to claim 1, wherein the plasma (2) is generated by corona discharge (8).
3. (Previously presented) The process according to claim 1, wherein the bonding surface is cleaned by the plasma (2).
4. (Previously presented) The process according to claim 1, wherein the bonding surface (1a) is chemically activated by the plasma (2).
5. (Previously presented) The process according to claim 1, wherein a layer of the bonding surface (1a) is removed by the plasma (2).
6. (Previously presented) The process according to claim 1, wherein a layer is grown on the bonding surface (1a) by the plasma (2).
7. (Previously presented) The process according to claim 1, wherein the substrates (1, 1') are connected directly during bonding.
8. (Previously presented) The process according to claim 1, wherein the substrates (1, 1') are connected via metal layers covering the substrates fully or partly.

9. (Original) The process according to claim 8, wherein the metal layers consist of copper.
10. (Previously presented) The process according to claim 1, wherein the plasma treatment takes place before a wet chemical cleaning of the substrates (1, 1').
11. (Previously presented) The process according to claim 1, wherein the plasma treatment takes place after a wet chemical cleaning of the substrates (1, 1').
12. (Currently amended) The process according to claim 1, wherein the plasma treatment takes place as the last step before bonding.
13. (Previously presented) The process according to claim 1, wherein the plasma treatment and the wet chemical cleaning take place several times.
14. (Previously presented) The process according to claim 1, wherein the plasma (2) is generated by using O₂ gas or O₃ gas or inert gases.
15. (Original) The process according to claim 14, wherein the plasma (2) is generated by using N₂ gas.
16. (Previously presented) The process according to claim 1, wherein CO₂, NH₃, forming gas or HCL or a mixture of said gases is used as the process gas.
17. (Previously presented) The process according to claim 1, wherein the plasma (2) is passed across the bonding surface (1a) of the substrate (1, 1').
18. (Previously presented) The process according to claim 1, wherein the bonding surface (1a) of the substrate (1, 1') is moved through the plasma (2).
19. (Previously presented) The process according to claim 1, wherein the plasma (2) and

the bonding surface (1a) of the substrate (1,1') are moved relative to each other.

20. (Previously presented) The process according to claim 17, wherein the plasma (2) is passed across the bonding surface (1a) in only one scan.
21. (Previously presented) The process according to claim 1, wherein the plasma (2) acts simultaneously on the bonding surfaces (1a) of a plurality of substrates (1, 1').
22. (Previously presented) The process according to claim 1, for the pretreatment in the bonding of semiconductor substrates or in SOI bonding.
23. (Currently amended) ~~A device for pretreating the surfaces (bonding surfaces 1a) of substrates (1, 1') before bonding comprising a device for generating a~~ A process according to claim 1 wherein the plasma (2) is generated by corona discharge (8) between a high voltage electrode (3; 31, 32) and a counter electrode and further comprising ~~wherein~~ a support (4,4') is provided for arranging at least one substrate (1, 1') in the plasma.
24. (Currently amended) The ~~device~~ process according to claim 23, wherein the support (4, 4') is configured as a counter electrode.
25. (Canceled).
26. (Currently amended) The ~~device~~ process according to claim ~~25~~ 23, wherein the substrate (1, 1) is arranged on the support (4, 4') in an electrically insulated manner.
27. (Currently amended) The ~~device~~ process according to claim ~~25~~ 23, wherein the high voltage electrode (3) and the support (4, 4') can be moved relative to each other,
28. (Currently amended) The ~~device~~ process according to claim 27, wherein the high voltage electrode (3) and the support (4, 4') can be moved relative to each other in

the horizontal (A) and vertical (B) directions.

29. (Currently amended) The ~~device process~~ according to claim 25 28, wherein ~~the there~~ is a distance (d) between the high voltage electrode (3) and the surface (1a) of the substrate (1) is 0.2 to 3 mm.
30. (Currently amended) The ~~device process~~ according to claim 25 23, wherein the corona discharge takes place at an electrode voltage of 10 to 20 kV and at a frequency of 20 kHz to 14 MHz.
31. (Currently amended) The ~~device process~~ according to-claim 25 23 comprising a means for treating substrates having a diameter *of* up to 300 mm.
32. (Currently amended) The ~~device process~~ according to claim 25 23, wherein ~~the~~ at least two substrates (I, I') are treated lying in the ~~sane same~~ same plane.
33. (Currently amended) The ~~device process~~ according to claim 25 23, wherein ~~the~~ at least two substrates (1, 1') are treated synchronously lying in two parallel planes.
34. (Currently amended) ~~Use of the device~~ The process according to claim 25 23 for pretreating in the bonding of semiconductor substrates.
35. (Currently amended) ~~Use of the device~~ The process according to claim 25 23 for pretreating of SOI bonding.
36. (Canceled).
37. (Currently amended) The ~~arrangement process~~ according to claim 1 36 ~~which comprises at least one device comprising a step for wet chemical cleaning that is arranged upstream of said arrangement prior to the pretreating step,~~